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Article

## Enabling Social Inclusion and Urban Citizenship of Older Adults through eHealth: The iZi Project in the Hague

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### Abstract

While the elderly constitute a significant proportion of urban population, they are often not included in the decision-making processes concerning their health requirements. These exclusionary practices could be viewed as reflecting deficits in urban citizenship as well as a denial of what the French sociologist Henri Lefebvre defined in 1968 as the ‘right to the city’ (Lefebvre, 1968). This article is concerned with promoting the social inclusion of the elderly in urban spaces. It focuses on the potential of eHealth to facilitate their independent living in their own homes, an expressed priority of the elderly. It discusses a pilot project pioneered by the Municipality of The Hague where attention and space was given for the elderly to express their physical and emotional needs in different fora with relevant stakeholders, and reflect on ways in which eHealth could be of help to them. These ideas were important in creating the iZi Experience Home project, which also served as an important tool for creating awareness, enthusiasm and information about the possibilities of technology. The article examines the different processes involved in the development of eHealth applications, including the nature of the deliberations, the devices evolved and tried out in the homes of the elderly. Such methods also raised understanding regarding the challenges of using eHealth, such as the barriers faced by service providers, the costs associated with the gadgets and the resistance of caregivers to these techniques. The project demonstrated that traditional eHealth applications were indeed important in supporting the elderly through increased mobility, security and ability to remain in their homes. But these need to be complemented by community generation, spaces for sharing experiences and physical face-to-face interactions to bring about more comprehensive well-being and happiness. There is therefore the need to broaden the concept of eHealth to move beyond technical solutions only but to include the ideas of the patients, in this case the elderly, in policies, discussions with stakeholders, innovations and practices. In these ways, the elderly are supported to claim their rights to the city. The discussion contributes to understanding the challenges of exercising urban enacted citizenship amongst the elderly, and the need to include inclusion and democratic participation as rights and norms of ‘age-friendly’ cities.

### Keywords

eHealth; elderly; home experience; positive health; rights to the city; The Hague; urban citizenship; urban participation

### Issue

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### 1. Introduction

Ageing and urbanisation have been identified as the “two inexorable and intersecting demographic trends” in the 21st century (Global Coalition on Aging & McGraw Hill

Financial Global Institute, 2016, p. 2). The proportion of people of 60 years and older has been increasing in the global population, rising from 382, million in 1980 to 962 million in 2017, a number predicted to increase to about 2.1 billion in 2050 (United Nations, 2017, p. 2).

Urbanisation has also increased at a remarkable pace. In 2018, 55% of the global population resided in urban areas, this figure rising from 30% in 1950 and predicted to increase to 68% by 2050 (United Nations, 2018). Older adults also increasingly contribute to the urban population; while their proportion of the urban population in the OECD countries was 7.7% in 1950, this figure rose to 17.8% in 2010 and is predicted to increase 25.1% in 2050, with 43% of all the people over 65 residing currently in cities (OECD, 2015). The OECD has therefore encouraged local governments to increase public health expenditure on health and social care, redesign infrastructure to suit the elderly, as well as foster improvements in social networks, access to services and affordable housing (OECD, 2015).

Older adults, however, experience social exclusion and other disadvantages notably with regard to “inequities in choice and control, resources and relationships, and power and rights in key domains of neighbourhood and community; services, amenities and mobility; material and financial resources; social relations; socio-cultural aspects of society; and civic participation” (Walsh, Scharf, & Keeting, 2017, p. 93). This exclusion can be viewed as both “a process and a state,” which bars them “from full participation in social, economic and political life and from asserting their rights” (Beall & Piron, 2005, p. 9). Social isolation and social exclusion of older people can also have a deteriorating effect on their health, wellbeing and quality of life (Nicholson, 2012). All these aspects pose serious challenges for government and other stakeholders involved in the wellbeing of older adults.

In the early 2000s, in the wake of growing demand and costs of healthcare, as well as the healthcare reforms and downsizing of hospital care, the Dutch government was keen to find ways of encouraging people to live independently at home for as long as possible and to give them more responsibility in health decisions that affect their lives (Council for Health and Care, 2002, p. 162). The potential of eHealth to improve efficiency and lower costs of care was viewed as an important option as more persons were familiar with and used the internet and other forms of information and communication technology (Kummervold et al., 2008). The concept of eHealth appeared initially in scientific literature in 1999 and associated with the possibility of patients, informal caregivers, healthy consumers, and healthcare providers using ‘smart’ technology, to improve their health and treatments (Eysenbach, 2001; Pagliari et al., 2005). The first eHealth monitor was presented to the Dutch government by the health expert centre Nictiz in 2013. It outlined the state of the art of eHealth, and included several options to improve eHealth services, such as creating greater awareness of options available, stimulating electronic exchange of data, and allowing patients to electronically review their medical records. Interested to understand the potential of such interventions for cost-effective and supportive interventions, the government

encouraged institutions and local municipalities to experiment with and develop eHealth facilities.

The Municipality of The Hague pioneered one such experiment in 2016 as part of its programme on ICT and care. The project was called “iZi—Living a Long and Healthy Life at Home” (*Gezond Lang Thuis*) and was concerned with supporting older adults to live as long as possible in their own homes by strengthening community development and developing appropriate technology (Gemeente Den Haag, 2015, 2016). An integral part of this experiment was to develop and check the value of eHealth and digital solutions for older adults with their involvement in the whole process. The emphasis on participation and discussion can be seen in the name iZi, which does not mean anything specific but the logo symbolises two persons (the Is) communicating with each other. These intentions were in line with research indicating that older adults preferred to live in their own homes as long as possible with adequate care givers or home services, but lacking these, adapt their own homes to their needs or move to another adapted dwelling (Roy, Dubé, Després, Freitas, & Légaré, 2018). The experiment incorporated the use of necessary and relatively uncomplicated equipment that the older adults would want or need to live in their own home as long as possible. Attention was to equipment that could be made available or adjusted with support of local welfare services. The aim was to enable residents to use the technology for a longer period of time by focusing on usability, satisfaction and integration on a daily basis. In addition, there was space given and encouragement to try out new, innovative technology or develop new solutions (Rijksoverheid, 2015).

As we have noted previously, eHealth is typically associated with the development of new information and communications technology that can improve the efficiency and quality of medical services. A guiding question of this article is if and how can such scientific innovations that focus on dealing with physical illness can also empower and improve the wellbeing of older adults. This article focuses on how eHealth facilities were implemented and developed in iZi and how the different processes influenced the social inclusion and urban citizenship of older adults. It shows that their roles in the deliberations and the decision-making processes enabled their individual and collective empowerment and social inclusion at the local level and with the Municipality. The article argues that it promoted a ‘deliberative democracy,’ enhancing, as Gaventa has observed, the “nature and quality of deliberation” and the promotion of a “democratic imagination” (Gaventa, 2006, pp. 13, 27). In many ways such developments can be viewed as promoting a form of “citizenship through enactments” (Isin, 2013, p. 43). The residents were able to negotiate for their ‘right to the city,’ a concept developed by Lefebvre to prioritise allowing access of all marginalised groups to the benefits of urban life (Lefebvre, 1996, p. 187). As he noted in 1991:

The right to the city, complemented by the right to difference and the right to information, should modify, concretize and make more practical the rights of the citizen as an urban dweller (*citadin*) and user of multiple services. It would affirm...the right of users to make known their ideas on the space and time of their activities in the urban area. (As cited in Lefebvre, 2000, p. 34)

Developing Lefebvre's concept, Harvey argues that the right to the city goes beyond the liberty of an individual to access its resources; it is a right to change ourselves by changing the city "involving the exercise of a collective power to reshape the processes of urbanization" (Harvey, 2008, p. 23).

This article deals with how residents of iZi through their involvement in eHealth interventions, made efforts to construct a more supportive and deliberative community, and to challenge their own social exclusion and isolation. This argument is developed in the following sections, where we first consider the characteristics of eHealth and its potential and challenges for supporting older adults. We then outline the philosophy and perspectives that guided the iZi experiment in particular, the processes of deliberation involved, some early outcomes and the key challenges in generating new ideas and eHealth facilities that could better support the older residents to remain in their own homes. Integrating their involvement, and providing the space and the means for older people to play a role in policies affecting their lives, we suggest that an essential outcome of the project was supposed to be more 'enacted' (i.e., active) forms of citizenship for older adults, including the sick. In contrast with the lack of voice experienced by many older urban residents in other contexts (Walsh et al., 2017), this study suggests that the eHealth iZi experiment was able to promote improved inclusion and civic participation of older urban residents in policies that affected them. As a result they experience improvements in their perceived health, safety and security. Many challenges and hurdles remain, but we are convinced this experiment has some important lessons for how to embed urban citizenship in practice, and how to promote the 'right to the city' for older adults in similar interventions in future.

## 2. Challenges: Can eHealth Meet the Needs of Older Adults?

In 2015, the Dutch Council for Public Health and Society defined eHealth as the "use of new information and communications technologies, and in particular internet technologies among others, to support or improve health and healthcare" (Council for Public Health and Society, 2015, p. 13). In 2019, the eHealth expert centre Nictiz broadened the notion of eHealth to include "the application of both digital information and health communication support and / or improve healthcare" (van Lettow, Wouters, & Sinnige, 2019, p. 6). The effective-

ness of eHealth is also highly dependent on the quality of the cooperation between the different stakeholders, the most significant of these being the patient, practitioner and the provider (Ganesh, 2004, p. 43).

These aspects framed the promotion of eHealth in the Netherlands. Such ideas are linked to the general literature on the characteristics eHealth applications. Eysenbach (2001, pp. 1–2) identified the "10 Es" that characterize eHealth. These were: (1) efficiency of healthcare; (2) enhancing quality of care; (3) evidence-based interventions; (4) empowerment of consumers and patients; (5) encouragement of a new relationship between the patient and health professional; (6) education of physicians through online sources; (7) enabling information exchange and communication in a standardized way between healthcare establishments; (8) extending the scope of healthcare beyond its conventional boundaries; (9) ethics associated with online professional practice, informed consent, privacy and equity; and (10) equity to make healthcare more equitable. While these different aspects were considered in the iZi project, this article focuses more directly on aspects relating to residents' empowerment and how this could promote Martin Seligman's (2008, 2012) notion of 'positive health' for older adults.

A review of the above characteristics of eHealth show that it assumes that people using such facilities have familiarity and skills with computer technology. Inadequate levels of literacy, often found among older adults, could result in the latter finding eHealth interventions too difficult to understand which could in turn lead to lack of motivation to even experiment with such tools. Studies have also shown that non-Western migrants often experienced a combination of age, language and computer barriers in using eHealth facilities, stressing the need for user-friendly eHealth applications (van Leuven, & van Dijk, 2017, p. 21). In her inaugural speech as professor of eHealth applications at the Open University in the Netherlands in January 2019, "eHealth Applications for Vulnerable Groups: A Challenge," Catherine Bolman warned that increasing resort to eHealth could lead to inequalities in healthcare (Bolman, 2019, p. 12). This process was associated with less likelihood that these applications would be used by weaker sections in society, including particularly older adults as the language and the content were often too difficult (Bolman, 2019, p. 13). She noted that 48% of the Dutch population struggled to manage their own healthcare, and lack adequate knowledge, motivation and self-confidence, which combined with low literacy and income did not offer many prospects for eHealth applications (Bolman, 2019, p. 13). According to her the increased resort to eHealth in healthcare could result in these persons "increasingly fall[ing] outside the boat" (Bolman, 2019, p. 14). She argues therefore for greater involvement of such groups in the "co-creation" of eHealth applications and strategies (Bolman, 2019, p. 21).

In addition, traditional practices of eHealth have also limits in overcoming some of the more structural, social

and emotional needs of older adults. It is well-known that one of the most common experiences of this group is isolation and loneliness. These issues can be helped and tackled by using computer and smart technology to link up with friends, relatives, carers and other providers. Feelings of insecurity could also be ameliorated through surveillance systems, while alarms and other voice reminders could help in ensuring that medicines are taken on time, as well as the need for rest and leisure. In addition, electronically controlled systems could also help in physical work which is difficult such as cooking, cleaning, opening windows and blinds, while other gadgets could help the elderly in the kitchen, bathrooms and other rooms. But at the same time, these tools do not necessarily deal with the root cause of isolation or exclusion, as most older adults who experience these problems do not have persons to interact with. Promoting community development could play an important role in overcoming these problem as shown in the case of iZi.

### 3. Philosophy of iZi: Inclusive and Age-Friendly Cities

Research has shown that older adults experience multiple forms of exclusion spatial, social and economic disparities in urban areas (World Bank, 2015). Furthermore, this group was also often overlooked in decision-making processes that affected their physical and emotional needs, even they have the right, as urban citizens, to participate and enjoy equitable benefits in urban society (Jehoel-Gijsbers & Vrooman, 2008). A priority in iZi was to counter these exclusions and to respect the views of this group.

Studies have shown older adults would prefer to live in their own homes as long as possible with adequate care or home services, but lacking these, adapt their own homes to their needs or move to another adapted dwelling (Roy et al., 2018). Després and Lord (2005, as cited in Roy et al., 2018) identified several psychological, social and economic reasons for this preference in addition to the home being an anchor, a space of safety and centre of daily life. These considerations have influenced the iZi pilot project. It focused on technologies that could support older adults live independently in their own homes with good quality and efficient healthcare services, as well as in a safe, secure and pleasant environment.

The philosophy of inclusion adopted by iZi was also in line with commitments of key international organisations as well as researchers. Their right to social inclusion is embedded in the 2030 Agenda for Sustainable Development, which states that no one should be left behind, and all should be provided opportunities to fulfil their potential in dignity and equality. In its approach to inclusive cities the World Bank has also argued that that interventions involving just one dimension of inclusion, such as architectural designs, will not be enough, since the “spatial dimension of inclusion cannot be separated from economic and social dimensions since it is usually socially and economically marginalized groups that inhabit phys-

ically deprived spaces” (World Bank, 2015, p. 10). The social dimension of inclusion was viewed as promoting “fundamental principles of rights, dignity, equity and security” with the most important factor being to recognize the role of the marginalized and work together with them in order to achieve inclusion (World Bank, 2015, p. 11). It has also paid particular attention on the participation and involvement of older adults in the decisions that concern their health and welfare. These principles were viewed as relevant in the development of iZi.

The World Health Organization (WHO) has also called for age-friendly cities that promote active ageing, optimising “opportunities for health, participation and security in order to enhance quality of life as people age” (WHO, 2007, p. 1). It recognises the “valuable capacities and resources of the older persons” which need to be considered when responding to their needs and preferences, while at the same time respecting their decisions on matters relating to their lives (WHO, 2007, p. 5). It highlights the need to promote their “inclusion in and contribution to all areas of community life” (WHO, 2007, p. 5).

Among the priorities identified by the WHO to promote healthy ageing was the establishment of a platform for innovation and change and a regular global forum on healthy ageing to share and “showcase innovative practice, successful pilots and scaled actions” like the iZi project in the Hague (WHO, 2017, p. 4).

Unlike a focus on cutting costs of care, however, the iZi experiment was more informed by the philosophy of ‘positive health’ for older adults. The concept was pioneered by Seligman who described it as more than the absence of illness but involved enhancing the “subjective, biological, and functional assets that could lead to more positive health outcomes” (Seligman, 2008, 2012). The project iZi assumed the standpoint that that the health needs of older adults needed to go beyond medical and welfare concerns of government, and that, their positive health wellbeing was positively influenced by being involved in deliberations, having connections and bonds with neighbours and in the local community, in addition to being able to access medical and health service providers. These features were different from governments viewing this group just as a recipient of welfare.

To this extent, it consciously integrated the active participation of older adults, or residents as they preferred to be called, in experimenting with, implementing eHealth and generating innovations and solutions. It provided opportunities for the residents to express needs and worries that went beyond the narrow understanding of medical health, including problems concerning finance, housing, loss of partners, loneliness and social exclusion. These processes will be discussed in the subsequent sections.

### 4. The Processes in iZi

A three-year pilot was started in February 2016 at the Steenhouwersgaarde, which was one street in the



Escamp district in The Hague. Out of the 260 households involved, 250 resided in social houses, owned by the housing corporation reflecting the relatively low income levels of the residents who are eligible for subsidized housing. A survey was undertaken with 92 residents, whose ages ranged between 50 years to over 90 years, the majority were between 70 and 89 years (50% were between 70 to 79 years of age, and 22% were between 80 to 89 years of age). As reflecting demographic patterns, women made out 60% of the participants, while 67% of the group lived alone. All the residents were invited to participate in the development and implementation of the project and it was up to the residents to decide if and how they could appropriately use their capabilities and skills (Leefwereldonderzoek, 2016). It is interesting to note that although the average age of this group was 76 years, the group was, on the whole, positive about their health, with 36% of them giving themselves a health score of 7 (on a scale of 1 to 10), 30% a score of 8 and 4% a score of 9. At the same time, the majority (over 60%) expected the quality of their health to change in the future, with issues such as mobility, less energy and other physical problems being of concern (Leefwereldonderzoek, 2016).

Shortly thereafter in May 2016 residents, were invited to participate selecting technology for user pilots and to be included in the iZi Experience Home. The aim was to discuss and identify (technological) solutions together. They were active during the deliberations to select the technology and provided important input for understanding and future use and development of products. As a result the iZi Experience Home project opened on 16 November 2016 where the residents were able to see and experience for themselves the potential of technological innovations for their health and wellbeing. This gave them insights into some 90 technological and non-technological solutions that were selected and sometimes installed by the residents themselves. These were for the different spaces used by persons such as the living room, kitchen, hall, toilet and bathroom, and the bedroom. Some of the items were a fire-repellent door, a robot companion pet cat, mobile alarms, vacuum cleaning robots, smartphones for seniors, remote controlled lighting, a Dementia App, facilities in the kitchen such as suitable lighting for cupboards, smoke detectors, suit-

able trolleys as well as ergonomically shaped appliances such as openers, cutlery. In addition, there were video intercoms for the front doors of apartments, night sensors in the halls, suitable locks and special beds. At the same time, project leader Erwin Tak emphasised that the focus was on what was necessary to have and technology that matched the needs of the older adults (Gemeente Den Haag, 2015, 2016; Leefwereldonderzoek, 2016).

In the process, the residents became more active volunteers and involved in the project. Some of them became 'Ambassadors' motivating others to join the discussions and spreading relevant information to interested persons, including visitors. By 2019 there were 15 iZi Ambassadors who shared and disseminated information on the project, and also welcomed visitors and guide them around the iZi Experience Home. Two of the Ambassadors were from a migrant background and were important in involving and supporting members of their own communities to engage in the activities of iZi. The visitors to the iZi experience home included Queen Maxima of the Netherlands and the Mayor of the Hague, Pauline Krikke, both of whom showed interest and support for the work. In addition, government and other institutions involved in care and social wellbeing, firms and marketing groups, research institutions as well as press groups visited the place. Among the remarks noted by the visitors in the logbooks of the experience home was the positive ambiance of the place, innovative approach of displaying convenient technologies that could be used by persons in a supporting environment. In addition several noted the enthusiasm and competence of the Ambassadors in providing information and encouraging persons to experiment with technologies.

The Ambassadors themselves commented that during the process, they had gained confidence in their ability to demonstrate the products and found their role during such events both enjoyable and rewarding. According to them they felt a sense of empowerment through the training and coaching they received as part of the project, and felt more able to experiment with digital technology and transfer these experiences to the other residents. They learnt new skills during the process, and gained knowledge on technology, which also gave them a sense of achievement, responsibility and purpose and in their own words "enjoyed a new career." The Ambassadors

**Table 1.** Background of visitors to the iZi Experience Home. Source: Registration Book provided by the project leader at iZi Community (December 2016–April 2019).

Type of (group) visitors	Number of visits at iZi Experience Home (February 2016–April 2019) in %
Groups of residents	5
Government and institutions for care and social wellbeing	19
Suppliers and companies	53
Knowledge Institutions	19
Press	4
Total (N = 203)	100

also visited other smart home projects, like iZi, have attended conferences relating to urban living and eHealth and have demonstrated the technology implemented in the iZi Experience Home project to a broader audience. They also communicate directly with the other residents during the weekly open hour visits.

In January 2017, the residents of the Hague were able to experience and test the new technological innovations in what could be viewed as a 'Living Lab,' the latter being supported by research and knowledge institutions such as University of Applied Sciences at the Hague to foster and exchange expertise on this issue. In March 2017, 102 residents were recruited to try out various technological solutions in their own homes for one year. This started with a visit to the Experience Home with the community builders, and subsequent interviews to match the individual needs to the available technology. For this purpose an interview tool was designed and tested to optimize the match (Haufe, Peek, & Ger Luijkx, 2019). Next, residents were allowed to use the matched technology for a maximum of 12 months during which the use and their experiences were monitored. The effects on outcomes (e.g., quality of life, participation, self-reliance, health-care usage) were measured independently by the Leiden University Medical Centre. Use cases per product were written up to provide feedback and suggestions for improvement to suppliers. The monitoring and outcome effects showed that there was need to increase awareness on technology, use personal context when matching technology (i.e., housing situation, digital literacy, personal network, attitudes toward technology), design technology for improved usability (especially digital interfaces) and providing (technical) support with installation and use is vital. To support implementation and use of technology a helpdesk and digital support group was installed, both with active involvement of Ambassadors who helped their peers.

In November 2018, the Hague Municipality won the World Smart City Award in the category "Inclusive & Sharing Cities." In this category where competing, among others, the cities of New York and Moscow (Newsbreezer, 2018). The award was presented at the Smart City Expo World Congress in Barcelona, the leading event for the called 'smart cities of tomorrow' (The Hague Online, 2018).

## 5. Deliberative Processes and Inclusion: Reflections

The participation and inclusion of the views of the residents were inherent to the development and decision-making processes involved in the experiment. At the start a series of workshops were organised, so called 'ateliers' to offer an informal and easy nature of discussion. In order to facilitate this key aspects of this approach included to encourage reciprocal behaviour (providing and receiving incentives), providing consistency, commitment (stepwise creating a relationship), sympathy (showing interest and empathy), authority (demonstrating ex-

pertise) and scarcity (exclusivity, wanting to be part of it): 62 residents volunteered to take part in the ateliers, of which 40 showed up during one of 3 meetings. The ateliers were designed as co-creative group sessions in which 'thinking together' is enhanced by creating a dialogue in which participants challenge each other to come up with solutions. During the first session the focus was on the future: what does it look like and what would help me, including technology. For the second session participants were invited to bring along family, friends or neighbours to take part in and enhance the process. A third session introduced examples and demonstrations of technology. No minutes were taken and there was no chairperson in these meetings but the project team were present to keep the discussions on track to the relevant themes. Their priorities also resulted in the inclusion of non-digital items such as effective handle bars, stools, toothpaste dispensers, beds for seniors, as these were specifically expressed by residents during the discussions. In this way, the requirements were initiated by the residents themselves and incorporated in the project.

The project was guided by the Quadruple Helix (QH) Stakeholder framework which is a "an innovation co-operation model or innovation environment in which users, companies, universities and public authorities co-operate in order to produce innovations" (Arnkil, Järvensivu, Koski, & Piirainen, 2010, p. 52). While there are different 'models' of QH, iZi reflected most the citizens-centred QH where the "the focus is on the development of innovations relevant for the citizens" and where "citizens are on the driver's seat and the innovations produced can be based on the knowledge of the citizens, firms, universities and/or public authorities" (Arnkil et al., 2010, p. 56). It meant that government, businesses, research parties and users/residents' organizations were encouraged to express their views and concerns, with the outcome reflecting joint commitment and potential for continuity.

Some suppliers were invited to demonstrate their eHealth tools, without any commitment. The residents were asked to be very honest and indicate which tools worked and which were ineffective for them. In the latter case, the technology was not included in the project. Other criteria for selection of technology included whether it was: (1) Feasible, meaning practical, affordable; (2) safe, including privacy; (3) scalable, as easily and widely usable and relatively inexpensive; and (4) innovative/original. At the same time, an inventory was done of potential suppliers and available technology. Collaboration with other parties in the neighbourhood that provide care and welfare to residents was sought and formalized. Based on these deliberations the relevant eHealth technology was selected for use in the iZi Experience Home. Subsequently, group meetings (cooperative workshops and design tables) specifically looked at which technology or support could play a role in fulfilling specific needs expressed by residents, such as on mobility, care, sustainability.

As a result the project developed in an iterative way, with new information and experiences influencing the implementation of the technologies. While this involved intensive efforts on the part of the project team and the residents themselves, it also promoted trust, alignment, excellent knowledge management and a clear decision framework, while paying attention to and respecting the interests and objectives of others. Based on these deliberations a variety of eHealth tools (no-tech, low-tech and high-tech) were evaluated in several meetings/workshops. Among the items considered in this process were smart televisions with internet connections, digital facilities (laptop, tablets, smartphones, etc.), the use of connectivity sites such as Facebook, sensor operated lights, the use of safety door cameras connected to tablet or phone via internet, and sensor operated lifestyle monitoring systems. In addition smart walkers, ergonomically designed kitchen appliances and other appliances in the bathroom were also experimented with.

Taking part in the process, being an Ambassador or experimenting with social technology (tablets, smart phones and robots) played a role in countering social isolation of the residents and promoting social cohesion through increased involvement in existing and new social activities. Communication between residents was also enhanced by new communication channels such as the digital newspaper, and helpdesk. There was also the *Digital Wall* newspaper created by the iZi team that provided relevant information on the activities of the different groups and committees in iZi, news reports, and possibilities for participation in different community activities. There were also weekly gatherings every Friday for discussion, the digital walk-in to discuss and share knowledge about technology every Thursday, iZi newsletter (by email and paper)—a specific Internet site, creative social media options, as well as the more simple but still important communication through letters, phone, mail, WhatsApp, and SMS:

All these enhanced the process of social inclusion and social cohesion, as noted by the coordinator of the iZi Ambassadors Leroy van den Hoonard (Personal communication 2019):

I think that the digital newspaper and digital walk-ins are contributing to new skills, and feelings of inclusiveness and appreciation. The digital newspaper provides essential information. Often the social activities are organized by the iZi Ambassadors and the residents committee. These activities have a social purpose: undertaking community activities. These activities connect and empower the majority of the community. I think our strength lies in the combination of all our communication channels and activities, allowing for more outreaching activities and ultimately also to more social cohesion among the residents. While we have several modern smart communication channels, such as WhatsApp and SMS, our residents and iZi Ambassadors appreciate the personal, warm contact

as best. This underlines that bringing warm and smart care is essential for residential participation.

Currently the digital support group is operated entirely by residents. They feel that they contribute to others by helping them and learn new skills themselves.

At the same time, most residents live alone and therefore sometime feel anxious that if something might go wrong there is no one they can call. Technology can help to alleviate these feelings and provide a sense of security, as explained by Wim Baanen (84), iZi Ambassador and resident:

In my home lifestyle sensors are installed. In all rooms there are small wireless sensors that record what I do or do not do all day. At what time I wake up for example, whether I have my breakfast or how much I move. In bed are sensors to measure my heart rate, among other things. All data is organized together on an app. At night, you can see what you've done all day. My daughter is watching [me] with it. For example, if I'm still lying in bed at twelve o'clock, my daughter can see that on the app. First of all, the system has recorded my common life pattern for two weeks. If I now show behaviour that differs greatly from the normal pattern, then there will be a warning. If you get incipient dementia or you have difficulties to use your legs, it can be useful.

## 6. Managing Challenges

The intention in the project was to include all the residents residing in the neighbourhood in the different activities. However, especially residents who originated from other ethnic or cultural background (i.e., Indonesian, Suriname, Turkish or Moroccan background) were less keen to participate initially. Even with intensified attempts (i.e., using interpreters, team members with a migrant background) and local contacts it proved difficult to reach and include them. Separate meetings were then set up with these persons, during which they could speak in their mother tongue (i.e., Turkish and Arabic). This approach was more successful as some participants were willing to take part in the technology pilots.

In addition, there was the problem of e-literacy, as previously discussed (Pharos, 2017). During the one-on-one interviews and group sessions it became clear that residents had different levels of digital experience, which in some cases hindered the use of technology. Support was provided in several meetings to guide residents who wanted to start with digital tools. Both professional as well as peers helped those who needed digital support. Most residents found it more comfortable to interact in a peer group as they felt more free to ask any question they liked, bring their own devices and take part on their own instigation. One female resident, aged 64, described this process as follows:



At first I was a little nervous to start using a smart-phone as I thought it would be difficult and too complicated to use and. But I took the opportunity to test it out, without any conditions, during the iZi pilot project. I am very glad I did, as this allows me to keep in touch with my family and friends through WhatsApp groups. I feel more socially included with the group. Now I even have started instructing others who are starters during the iZi digital walk in sessions.

While the elderly were actively involved in the deliberations, they had to also deal with the fact that some stakeholders—using Ganesh’s triangle—were not cooperative or committed for different reasons. The healthcare organizations demonstrated limited commitment, mainly because most did not—as yet—use eHealth applications on a large scale, and also had to comply with competing rules and laws (Luiten, 2018). As a result, their flexibility to meet the needs of the elderly was restricted by rigid procedures that sometimes unintentionally imposed unnecessary restrictions. Healthcare organizations also used few data-driven solutions regarding the care needs of older adults. As a result, new technological options were often viewed as the responsibility of the individual. An example of this problem is the case of the active alarm system that one resident selected and wanted to test at home. As it did not comply with the system that was used by the healthcare provider’s organization, the resident was instructed to change to the organization’s preferred system.

While the needs and possible solutions were deliberated and selected, there were also several examples of bad (user) design, supply driven development and mismatches that are illustrative of the need to include prioritise the context of the residents. For example, the robot walker which was designed to support mobility and provide other support (communication, exercising, stability, etc.) did not fit the users home and daily routines. Most homes were too small or crowded which forced the walker to auto stop as it was guided by sensors, while the additional functionalities were not relevant for older users.

Caregivers were often required for the use of technology and this created some challenges and sometimes even resistance. For instance, the alarm systems usually called a caregiver in case of emergency. If there were no caregivers present or they refused to participate with the new technological applications, it could not be used. New products and services that had the potential to make life easier for the residents were sometimes resisted by family or caregivers as they did not fully understand the relevance of these devices, or even felt threatened in their role as primary care giver. But most of these challenges were taken up in the various meetings, and negotiated with the different groups involved. It became increasing clear however that the involvement of the residents in the discussions on these different matters did generate more relevant innovations and as such played a vital role

in the implementation and development of eHealth for older adults.

Finally, the lack of adequate financial resources limited the use of technology. For instance, most digital solutions required internet connections which meant extra (unforeseeable) costs which made some residents decide not to use an application. Furthermore, while the residents were on the whole satisfied with their material situations (a score of 8.1 was given, out of 10) there were also financial concerns, with nearly a half of them expecting life to become more expensive particularly with the reduction in (state)pension, less welfare, higher healthcare costs. They indicated however that they lived relatively sober were price conscious. These discussions also underscored the need to provide financing options for low income residents in order to make the promises of eHealth accessible to all who need them.

## **7. Conclusion: eHealth, Social Inclusion and Urban Citizenship?**

The project and the iZi Experience Home project were able to generate a great deal of energy, enthusiasm and participation, and brought together a unique hub that connected residents, research institutions, governments, care and welfare organizations, and businesses in the field of healthcare innovation. On the whole the residents and the other stakeholders who participated in the project were positive about this approach. A strong community was created in the process providing the necessary room to deliberate the needs and rights of the elderly and to finding ways of dealing with their challenges. The active involvement of the residents in these processes and incorporating their ideas and experiences at an early stage reflects the principles of urban and enacted citizenship. The manner of participation and deliberations in iZi did promote the individual and collective empowerment and social inclusion of the residents. They were encouraged to become involved in the process, and room and time was provided for discussion on their needs, priorities and opinions. As a result, residents became open to modern technology, even if they were not experienced with it. The Alderman for Care, Youth and Public Health, Kavita Parbhudayal noted that a major lesson from this project was how discussions and active engagement could play a vital role in matching senior citizens with relevant technology (ICT and Health, 2019, p. 19).

The experience of the iZi Experience Home project demonstrated that eHealth applications were indeed important in supporting older adults through increased mobility, security and ability to remain in their homes. But such technologies need to be complemented by involvement them in the decision-making processes, as well as the creation of a deliberative community to share experiences and have physical face-to-face interactions to foster social inclusion, urban citizenship and empowerment. There is therefore the need for municipalities and

other relevant groups to broaden the concept of eHealth to move beyond technical solutions. The participation of older adults, in this case the residents, in the spaces and discussions were significant in several ways; they were able experiment and decide for themselves the feasibility of equipment, they were to provide vital feedback to the suppliers for improvement, they were able to create a caring community where persons could share their physical and emotional worries and problems.

All these promoted their social inclusion and their claim to their Rights to the City. In this project, enacted citizenship went beyond formal obligations and entitlements, and embraced what can be seen as the “practices through which individuals and groups formulate and claim new rights or struggle to expand or maintain existing rights” (Siemiatycki & Isin, 1997, p. 73), one right being involved in the decisions that affect their lives (Purcell, 2003). And while older adults continue to face challenges in enacting their urban citizenship and their right to the city, iZi has clearly shown that democratic participation and social inclusion can become norms and rights of age-friendly cities, and promote their social inclusion and empowerment.

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### Conflict of Interests

The authors declare no conflict of interests.

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